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FROM FCS AND POL/ECON

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SUBJ: CIVIL NUCLEAR WORKING GROUP OF THE TRADE PROMOTION COORDINATING COMMITTEE (TPCC) REQUESTS INFORMATION SUPPORT ON COUNTRIES' PLANS TO EXPAND NUCLEAR ENERGY: SWITZERLAND

REFS: (A) STATE 127468 (B) UNVIE 576

¶1. This cable is Embassy Bern's response to ref a regarding Switzerland's plans to expand nuclear energy and our responses to the questions in para 8 of ref a as an initial overview of Switzerland's Civil Nuclear Power program. FCS Bern has already reported on this topic in the past through the Commerce Market Research Library and post will continue to report on this topic in 2009 as further information becomes available.

¶2. Summary:

Switzerland has plans to expand its Civil Nuclear Power Program, both in terms of reactor construction and spent fuel management (uranium mining is not in the picture at all and as far as we know Switzerland does not export fuel supplies).

These plans are based on the Federal Council's revised policy of 2005 to continue to rely on its five existing nuclear reactors and to replace them over time as needed. The underlying motivation is to ensure independent capability to meet anticipated power shortages and energy security. The federal government's role is however limited largely to approving new plants and ensuring disposal of nuclear waste; it has little or no role in financing and operating, as these functions are carried out by so-called private companies, which to some extent are owned and certainly influenced by the state (cantonal) governments but nonetheless operate like most commercial entities. The Swiss nuclear regulatory authority ask, which has been part of the Swiss Department of energy but will become independent in 2009, has broad inspection and enforcement powers. Switzerland's domestic nuclear liability law is being updated under a revised law of June 2008 and brought into line with international conventions (notably the Paris convention). The Swiss Manufacturing base is heavily involved in nuclear-related products or services (but not mining or reprocessing for export, rather in high-tech components and services), and there is a balance between locally sourced components and services and those from outside Switzerland, especially Germany and the United States. Switzerland should not experience any problems in terms of the nuclear-trained workforce, although again it often relies on foreign suppliers. Anticipated

nuclear tenders for new plants are still years away, as they are subject to governmental approval and probably popular referendum as well, but tenders are issued by the commercial entities that own and operate Swiss nuclear facilities, not by the government at federal or state (cantonal) level. As U.U. suppliers already have a footing here, it can be presumed that they were successful in the procurement or tender process. There are numerous sectoral opportunities for U.S. industry across a broad spectrum of best prospects. The primary companies domestic and foreign in the industry are listed below. There are foreign competitors but we are not aware of any formal or potential agreements at this time, except in the research area. As a neutral country and staunch supporter of non-proliferation, Switzerland has no particular political considerations in terms of cooperating with competing nuclear supplier states. End summary.

13. The following items a-l respond to questions 1-11 in para 8 of reftel a:

1A. Does Switzerland Plan to Expand its Civil Nuclear Power Program?

Yes, Switzerland's energy policy as revised in 2005 BY THE FEDERAL COUNCIL calls for new and replacement nuclear power stations.

Switzerland has five operating reactors at four sites (Beznau I and II, Muehleberg, Leibstadt and Goesgen). With ageing nuclear power plants which have to be phased out over the next 10-20 years, the

government decided new nuclear power plants (which provide clean, CO<sub>2</sub> free energy) are needed to prevent a power shortfall after 2020. Of the power produced in Switzerland, 40 percent is generated from the five nuclear power plants, and the other 60 percent is mainly generated from hydropower with a small (approximately 5 percent) but growing contribution from renewable energy sources. No fossil fuels (oil, coal, natural gas) are used in Swiss ELECTRICITY production. Electricity production represents roughly one-third of Swiss energy production, which is reliant on imported fossil fuels to a high degree.

In June 2008, Atel (<http://www.atel.eu/en/group/>) submitted an application to the Federal Office of Energy (<http://www.bfe.admin.ch/index.html?lang=en>) for a general license to build a new nuclear power station in Niederamt, Solothurn(district of Goesgen/Olten). In December 2008, the Axpo Group (<http://www.axpo.ch/internet/axpo/en/home.htm> l) and BKW ([http://www.bkw.ch/en/home/inhalte.html?chang\\_eLang=en](http://www.bkw.ch/en/home/inhalte.html?chang_eLang=en)) established a joint company to develop plans for two new nuclear power plants to replace Beznau I/Beznau II and Muehleberg and submitted two framework applications to SFOE for the licenses.

Hence, permits for three nuclear power plants may (or may not as SFOE told us) be sufficient to offset post-2020 power shortages. Atel may join forces with Axpo and BKW and, in any case, the Federal Council and Parliament must ultimately approve THEM. HENCE, permits for three nuclear power plants are now under review, although ANY NEW plants may be challenged as Swiss direct democracy entails almost certainly a popular referendum as early as 2012 or 2013. A recent survey revealed that a narrow majority of Swiss people polled are in favor of nuclear energy for the production of electricity. For the first time, the survey revealed that in spite of big efforts to conserve energy, 46% of the public views the construction of additional nuclear power sites as essential, while 44% of the public deem additional nuclear power plants superfluous. If a referendum were held today, the survey concluded that 47% would vote in favor of the erection of new sites, while 43% would vote against such plans. This is a major shift from a survey conducted one year ago, wherein 44% of all the people polled were in favor, and 50% were against the construction of a new nuclear power plant.

Detailed reports of October and December 2008 on the new plants by the Commercial Service/US Embassy Bern are available on the Commerce Market Research Library  
<http://www.buyusainfo.net>

The national Cooperative for the Storage of Radioactive Waste (NAGRA) was established in 1972. It was entrusted with the mandate

of identifying a safe long-term solution for the disposal of all radioactive waste produced in Switzerland -- a mandate that has not yet been fulfilled. At present, radioactive waste is being stored safely in special containers in well-secured halls at an interim storage site in Wuerenlingen, and at the nuclear plants themselves. Switzerland's Nuclear Waste Management Concept calls for two repositories: one for low and intermediate level waste and another for high level waste. Alpha toxic waste may be stored in either of the sites. However, this radioactive material needs to be safely stored for up to a million years, and for this purpose, storage above ground is not a suitable long-term solution. Today, fully developed concepts exist for the permanent storage of radioactive waste in geological formations, but so far it has not been possible to find a site for a deep geological repository.

With the new legislation that entered into effect in February 2005 (Nuclear Energy Act and Nuclear Energy Ordinance), the Federal government adopted a new approach: the search for a suitable site

is now to be carried out within the scope of the sectoral planning procedure. The objective of the Deep Geological Repository Sectoral Plan is to ensure that, as major projects of national importance; deep geological repositories can be decided upon and constructed on the basis of an independent, transparent and fair procedure. This process is managed by the Swiss Federal Office of Energy (SFOE).

#### I.B. Switzerland's Underlying Motivations

Switzerland's underlying motivations include anticipated power shortages due to the eventual decommissioning of the five existing nuclear power plants, the fact that Switzerland is committed to non-fossil fuel energy sources with reliance on nuclear in addition to hydroelectric as clean, non-CO<sub>2</sub> emitting energy sources, and the expiration of the import contracts with France (which relate to energy security). Switzerland's energy posture is based on independence from foreign sources of electricity, especially when compared to most of Europe's reliance on Russian and other foreign sources of fossil fuels.

#### I.C. Government's Role in Financing, etc.

The Swiss central (federal) government's role in the financing of the civil nuclear sector is certainly limited, especially in comparison with that of other market economy countries, including the United States. (SFOE noted that Federal funding is limited to research on waste disposal, safety, etc.) Under the Swiss confederal system, the cantons have historically played and continue to play a very large role in energy development (both hydroelectric and nuclear), and Canton Bern is in fact the majority owner of BKW. The Cantons generally have ownership and influence on the "private" utility companies that own and operate the nuclear facilities. These companies in turn have close relationships with larger European energy holding companies (e.g., BKW is 21 percent owned by the Munich energy holding E.ON Energie AG).

#### I.D. Switzerland's Nuclear Regulatory Authority

The Federal Nuclear Safety Inspectorate (HSK), which had been affiliated to the SFOE, is now becoming legally independent as of January 1, 2009. It inspects and evaluates nuclear safety and radiation protection at the Swiss nuclear power plants (<http://www.hsk.ch/english/start.php>).

Acting as the regulatory body of the Swiss Federation, the Inspectorate assesses and monitors nuclear facilities in Switzerland. They include its five nuclear power plants, the plant-based interim storage facilities, the Central Interim Storage Facility at Wuerenlingen together with the nuclear facilities at the Paul Scherrer Institute (PSI) and the two Universities of Basel and Lausanne, as well as the Institutes of Technology in Lausanne and Zurich. The Inspectorate assesses the nuclear safety of these facilities and using a mixture of inspections, regulatory meetings, examinations and analyses as well as reports from individual plant licensees, it obtains the required overview of nuclear safety. The Inspectorate ensures that facilities observe the regulations and that operations comply with the legislative framework. In addition,

its regulatory remit includes the transport of radioactive materials and preparations for a deep geological repository for radioactive waste. The Inspectorate maintains its own emergency organization, which is an integral part of the national emergency structure and would be activated if there were a serious incident in a Swiss nuclear facility.

HSK has 106 employees and expects that number to go up by roughly 10-20 percent in the near future. It currently has 4 open positions

advertised on its website.

#### E. Switzerland's Nuclear Liability Law Updating

The Swiss Parliament approved the new Federal Nuclear Energy Liability Act on June 13, 2008, which is based upon the revised international nuclear liability regime, called the Paris Convention and the Brussels Supplementary Convention, and provides a compulsory liability coverage of Euro 1.2 billion (USD 1.6 billion). Switzerland's revised Federal Nuclear Energy Liability Act can only be enacted by the Federal Council once the revised Paris Convention has been ratified. The amendments to the Paris Convention need to be ratified by two-thirds of the contracting parties e.g. ten countries, and by all contracting parties for the Brussels Amendments, e.g. twelve countries. It is anticipated that Switzerland will ratify both amendments within the first six months of 2009, but final ratification by the required number of countries is expected to take 1-2 years.

The Swiss Federal Office of Energy (SFOE) will concurrently work out the necessary details pertaining to the Nuclear Energy Ordinance. The Federal Nuclear Energy Liability Act and the Nuclear Energy Ordinance are slated to go into force in 2010 or thereabouts. The existing Federal Nuclear Energy Liability Act, entered into effect on January 1, 1984, applies with a compulsory liability coverage of Sfr. 1 billion (USD 850 million) until implementation of the revised Federal Nuclear Energy Liability Act.

#### F. Swiss Manufacturing Base versus imports

Yes, the Swiss manufacturing base, which is oriented already to high-precision, high value-added and advanced technology in general, is particularly well-suited to supplying its own energy companies products and services both in the nuclear and the hydroelectric fields. However, as reported by Commercial Service Bern, U.S. companies like General Electric are very active in supplying and maintaining Swiss power plants, both nuclear and conventional hydro, especially in turbine technology, and German and other foreign companies are also competitive in many subsectors.

It is very likely that many of the components or contracting services for new plants could be sourced locally, but imports would certainly be involved. We have not yet developed detailed product and service information by HS code or other categories nor determined the relative weight of imported versus domestic sources, which would vary widely by subsector. Various trade statistics are readily available; domestic production figures less so.

The market research reports referred to above indicate that the "best prospects" for U.S. exports can be described as follows:

All of the nuclear power plants in operation today in Switzerland are based on light water reactor (LWR) technology, which includes both boiling water reactors and pressurized water reactors. General Electric has made significant inroads on the Swiss market with its boiling water reactors. GE is in charge of maintenance and overhaul services at nuclear power plants using GE technology, also providing (spare) parts, components, and software technology in support of the upkeep of the plants. Operators of nuclear power plants frequently turn to U.S. suppliers for projects that require highly skilled labor and have entire teams on site to carry out these specialized projects. U.S. technology to encompass generators, reactors, cooling pumps, parts and components as well as software is highly regarded among Swiss operators of nuclear power plants. These are the product sectors that are deemed to have an above-average growth potential.

#### I.G. Nuclear-trained Workforce

Switzerland's approach to training is similar to that of Germany, with a strong emphasis on technical training, on apprenticeships, etc. In general, the orientation of the labor force is highly planned during the educational period, and the provision of engineering specialists, technicians, and construction for the nuclear workforce would be no exception. The maintenance and expansion of civil nuclear power, given that Switzerland already has 5 maturing facilities should not pose any significant requirement for a foreign workforce. As already noted, Switzerland relies on General Electric and other foreign suppliers for several requirements in its nuclear and non-nuclear power facilities. Specifics on programs in place or being developed have not yet been fully researched, but as indicated above in the material on the HSK the Universities of Basel and Lausanne (as well as the Institutes of Technology in Lausanne and Zurich) are involved in nuclear training.

#### I.H. Nuclear-related Tenders/Procurements

CS Switzerland is not aware of any nuclear-related tenders at the present time. As a general rule, nuclear power plant operators exercise discretion in inviting bids, and selective, discretionary tenders are quite common. In general, quality and technical criteria are more important than price in bid decisions. Foreign firms may be required to provide a Swiss bank guarantee if they have no local office or representation. Notices of tenders are published in the official trade journal Handelsamtsblatt. While there is no requirement to have a local agent to bid, it is advantageous when equipment needs training, service or parts. CS Switzerland endeavors to list tenders on its website and has a direct link to the CS EU website with a comprehensive listing of tenders.

#### II. nuclear opportunities for u.s. industry

U.S. suppliers have solidified their position in the Swiss market over the years. Operators of nuclear power plants frequently turn to U.S. suppliers for projects that require highly skilled labor and have entire teams on site to carry out these specialized projects. U.S. technology to encompass generators, reactors, cooling pumps, valves, parts and components as well as software technology is highly regarded among these nuclear power plant operators. Opportunities for U.S. suppliers lie in the areas of plant design, equipment for the commercial nuclear electric power industry, reactor sales, waste management, engineering services, fuel management services, radioactive waste conditioning/disposal as well as emergency training. These are the areas that are deemed to have above-average growth potential. The overall Swiss nuclear power plant market is highly competitive with an abundance of suppliers and strong price competition. Procurement decisions are based upon price and performance. Operational and technical aspects, maintenance and life-cycle costs and risk are also taken into account when contracts are awarded to both domestic and foreign suppliers.

#### I.J. Primary Companies Domestic and Foreign

The U.S. suppliers Westinghouse and GE as well as German supplier Siemens have made major inroads in the Swiss market, garnering a substantial share of the overall civil nuclear sector. The country's first commercial units were Beznau-1 - a Westinghouse pressurized water reactor ordered by NOK (Nordostschweizerische Kraftwerke AG), and Mühleberg - a General Electric boiling water reactor ordered by BKW (Bernische Kraftwerke AG). Following these three units, a consortium of utilities - Kernkraftwerk Gsgen (KKG),

ordered a large PWR from Siemens KWU for Gsgen and another utility consortium (KKL) ordered a similar-sized General Electric BWR for Leibstadt. These companies provide maintenance and overhaul services, also supplying spare parts, components, and software technology in support of the upkeep of the plants. Furthermore, the world-renowned leader in power and automation technologies ABB is a major player on the Swiss energy market,

providing nuclear waste facilities, LWR fuel, BWR rods, fuel management services, etc. Colenco Power provides services that include contractual advice, procurement of nuclear systems, radioactive waste conditioning/disposal and emergency training. ICT Inter Control Technology AG is a major player in Switzerland involved in the installations and equipment for the examination of spent fuel elements and fuel rods, remote handling systems, and nuclear robots. Pedi AG provides protection systems for people involved in the production, supervision, maintenance and emergencies and remote handling tools.

**IK. Are there other nuclear supplier countries engaging Switzerland on its civil nuclear power program?**

There is an agreement between Switzerland and the European Atomic Energy Community (Euratom), which provides for Switzerland's involvement in EU-sanctioned research programs in the peaceful uses of nuclear energy. However, there are no agreements whereby Swiss enterprises are involved in any activities in foreign civil nuclear power programs.

**IL. political considerations**

It is difficult to assess "political considerations" absent a concrete context involving one or more particular countries, and without regard to whether we are viewing Switzerland as a receiver of nuclear materials and equipment or as a sender. It should be noted that Switzerland has maintained both strong neutrality and anti-proliferation stances in its international relations, and also has laws against the export of items that can be used in warfare.

In general, Switzerland combines its domestic energy policy with international aspects via its representation in international organizations, including the International Energy Agency, the International Atomic Energy Agency, as well as multilateral and bilateral negotiations on energy policy, non-proliferation of nuclear weapons, and monitoring nuclear exports.

Switzerland is involved with several bilateral committees dealing with the safety of nuclear installations, including bilateral committees with France and Germany. Relating to the U.S. alone, Switzerland maintains the following agreements: US atomic energy commission and the Swiss Division of Science and Research to exchange information in the field of fast reactor physics; US Department of Energy and the Swiss Federal Institute for Reactor Research in the area of carbide fuel development; Swiss Federal Council and the U.S. Government on the peaceful uses of nuclear energy; Swiss Federal Office of Energy and the US Nuclear Regulatory Commission on severe accident research, probabilistic risk assessment research, safety research on deregulation, and related aging research; Swiss Federal Office of Energy and the US NRC for the exchange of technical information and cooperation in nuclear safety matters; and most recently, Swiss Federal Nuclear Safety Inspectorate and the US NRC for the exchange of technical information and cooperation in nuclear safety matters.

**I4. Note:** SCO Donald Businger and Senior Commercial Specialist Sandor Galambos of FCS Bern met on December 12, 2008 with the Swiss Federal Office of Energy (SFOE) Deputy Director Werner Buehlmann and

Energy Supply Specialist Christian Schaffner to collect input for this cable.

(FCS: DBUSINGER/SGALAMBOS; ECON: LFRERIKSEN/RDELALANDE)

CARTER

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